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ORIGINAL ARTICLES.

UPON VIRULENT DISEASES, AND IN PARTICULAR UPON THE DISEASE VULGARLY CALLED CHICKEN CHOLERA.

BY M. PASTEUR.

Virulent diseases are counted amongst the greatest scourges. To be convinced of it, one has only to name measles, scarlet fever, small-pox, syphilis, glanders, yellow fever, typhus, cattle plague, etc., etc. This list, already so loaded, is far from being complete. All the great pathology is there.

As long as the ideas of Liebig upon the nature of ferments prevailed, the various forms of virus were considered as substances thrown into an intestinal motion, capable of communicating itself to the materials of the organism, and of transforming them into virus of the same nature. Liebig knew that the occurrence of these ferments, their increase and their power of decomposition, have a startling resemblance with the phenomena

of life ; but he said in his *Treatise of Organic Chemistry* that this was only a deceiving mirage.

All the experiments that I have made for the last twenty-three years have tended, directly or indirectly, to show the inexactitude of the opinions of Liebig. From the beginning, that is about 1857, a method almost unique has served me as a guide in the study of microscopical organisms. It consists essentially in the culture of these little beings in their pure, original condition, unaffected by any of the heterogenous matters, living or dead, which accompany them. In using this method, the most difficult questions sometimes receive easy and definitive solutions. I will recall one of the first applications I made of it: Ferments, said Liebig, are all those nitrogenous compounds of the organism, fibrin, albumen, caseine, * * * in the state of alteration that they undergo by the effect of the contact of air. Fermentation, in fact, is not known where such compounds are not present and active. Spontaneity was claimed all over as the originating cause of the inception and march of fermentation as in those of diseases. In order to demonstrate that the theory of the learned German chemist was, to use his own words, only a "deceiving mirage," I employed artificial media, containing only pure water, with the mineral substances necessary to life, fermentable matters and the germs of ferments of those different matters. In those conditions, fermentations took place with a regularity and a purity, if I may so say, which did not always exist in the natural spontaneous fermentations. All albumenoid substances being left aside, fermentation developed as a living being, which borrowed from the fermentible elements all the carbon of its successive generations and from the mineral medium the nitrogen, phosphorus, potassium, magnesium, elements whose assimilation is one of the necessary conditions of the formation of all beings, great or small.

Thus, not only was the theory of Liebig proved without foundation, but the phenomena of fermentations presented themselves as simple phenomena of nutrition, taking place in exceptional conditions, amongst which the most strange and significant no doubt, is the possible absence of the contact of air. Human

as well as Veterinary Medicine, saw the importance of these new results, and researches were especially made to determine whether the virus and contagia in question were not animated beings. Davaine (1863), labored to bring up in evidence the functions of the bacteridæ of anthrax, which he had seen in 1850; Chauveau (1868), tried to prove that virulence was due to the solid particles previously discovered in all virus; Klebs (1872) attributed traumatic virus to organisms; Kock (1876), by the method of culture, obtained the corpuscle germs of bacterides, in every point like those I had already demonstrated for vibrios and the etiology of several diseases was found to be due to the existence of microscopical ferments. To-day, the most rebellious objectors to the doctrine of the germ theory are doubtful. But what obscurity yet remains on several points? In the great majority of virulent diseases, the virus has not been isolated, still less demonstrated alive by the method of the cultures, and everything tends to show from those unknown proofs of pathology, the existence of mysterious morbid causes. The history of the diseases they give rise to, presents also extraordinary circumstances, amongst which must be first named the obscure one of *recidity*.* What a strange circumstance! Scarcely from this fact would imagination hazard a hypothetical explanation resting on some experimental basis.

Is it not surprising to observe that vaccine, a virulent disease by itself, but benignant, protects not only from itself, but also from a most serious disease, small-pox?

These facts are known since the oldest antiquity, for variolization and vaccination are practices known in India from immemorial times, and when Jenner demonstrated the efficacy of vaccination, country people, amongst whom he practiced, knew that cow-pox protected from variola. This fact of vaccine is unique, but that of the non-recidity of virulent diseases seems general. The animal organism is not twice affected with measles, scarlet fever, typhus, variola, syphilis, * * * at least immunity lasts for a variable length of time.

* A second attack.

Though realizing the propriety of a becoming humility in presence of these mysteries, I hope that the society will see in the facts I have the honor to present, unexpected explanations of the problems presented by the study of virulent diseases.

Sometimes in poultry yards, a fatal disease known as *chicken cholera* makes its appearance. Thus affected, the animal is weak, staggering, its wings dropping, its feathers staring. If forced to open its eyes, it seems to wake up from a deep sleep, and soon returns to this condition until death takes place in a comatose agony, and almost without a struggle. The internal lesions are extensive. The disease is produced by a microscopical animal which, according to Zundel, had been suspected first by M. Moritz, later, better described in 1878 by Perroncito, and as late as 1879 by Toussaint, who has demonstrated by the culture of the little organism in neutralized urine, that it was truly the cause of the virulence of the blood.

In the study of microscopic-parasitic diseases, the first and most useful condition to fulfil is to have a liquid where the infectious organism can be easily cultivated and always without a possibility of mixture with other organisms of different species. Neutralized urine, with which I was so successful in proving that the culture of the bacteridæ of Davaine was certainly the virus of anthrax, was bad for this double object. But the bouillon of muscles of chicken, neutralized by potash and rendered sterile by a temperature above 100 degrees (110 to 115 degrees,) forms a medium for culture well adapted to the life of the microbe of chicken cholera. The facility of the multiplication of the microscopic organisms in this medium is prodigious. In a few hours, the clearest bouillon becomes turbid, and is filled with a larger number of small bodies, extremities fine, slightly strangulated in the middle, so that at first sight they look like isolated points. These bodies have no proper movement. In a few days, already so small when in the way of multiplication, they increase in number, and form a multitude of points so reduced in size that the liquid of culture, turbid at first, so as to look milky, becomes scarcely cloudy by the presence of smaller points, rigorously unmeasurable, so small is their diameter. This microbe certainly

belongs to a different group than that of the vibrios. I imagine it will take its place at a future day with the virus yet of unknown nature, when, as I hope they soon will be, these last virus will have been successfully cultivated.

The culture of our microbe presents very interesting peculiarities.

In my preceding studies, one of the media of culture that I have utilized with the most success is the decoction of hops-yeast (*levure de bière*) with water, filtrated to a state of perfect limpidity, and then rendered sterile by heat above 100 degrees. The most varied microscopic organisms do well in this liquid, specially if it is neutralized. For instance, the bacteridæ of anthrax grow in it in a few hours, in a surprising manner. It is a surprising fact that the medium of culture is quite fatal to the life of the microbe of chicken cholera; in less than forty-eight hours it dies. Is it not this that is observed when a microscopic organism remains inoffensive to an animal species upon which it has been inoculated? It is inoffensive, because it does not develop in the body of the animal, or because its development does not reach the organs essential to life.

The sterility of yeast, sown with the microbe, offers a precious mean of recognizing the purity of the cultures of this organism in the bouillon of chicken. A pure culture, sown in yeast, gives in it no development; the yeast remains limpid. On the contrary, it becomes turbid, and cultivates by the organisms of impurity.

I pass now to a still more singular peculiarity of the culture of the microbe of chicken cholera. The inoculation of this organism to Guinea-pigs does not produce death as surely as in chickens. In those animals, of a certain age especially, one observes only a local lesion at the point of inoculation, which ends by an abscess of various size. After opening spontaneously, this closes up and gets well without the animal losing its appetite, or exhibiting any of the signs of disturbed health. Sometimes these abscesses last for several weeks before suppurating, surrounded by a pyogenic membrane, and filled with creamy pus where the microbe swarm alongside the pus corpuscles. It is the

life of the inoculated microbe which gives rise to the abscess, which becomes, for the small organism, as a closed vase where it is easy to obtain it, even without killing the animal. It keeps there, mixed with the pus, in a great state of purity and without losing its vitality. The proof of it is that, if one inoculates chickens with a little of the contents of the abscess, these chickens die rapidly, while the Guinea-pig, which has furnished the virus, gets well without the slightest suffering. One sees, then, a localized evolution of a microscopic organism which stimulates the formation of pus and of a closed abscess, without producing internal disorder, nor the death of the animal upon which it is met, and always ready at least to carry death to other species to which it is inoculated ; always ready even to kill the animal in which it exists in the state of abscess, if such circumstances more or less fortuitous, cause it to pass in the blood or in splanchnic cavities. Chickens or rabbits living with guinea-pigs having such abscesses might become suddenly sick and die, and still the health of the guinea-pigs seem to remain perfect. For this it would be sufficient that the abscesses of the guinea-pigs, ulcerating, should throw a little of their contents on the food of the chickens and rabbits. Witnessing these facts, and ignorant of the connections I am relating, an observer would be surprised at the death of the chickens and rabbits without apparent cause, and would refer it to the spontaneity of the disease ; as he might not believe that it would have started from the Guinea-pigs, all in good health, and especially if he knew that this specie of animals is, itself, subject to that disease. How many mysteries in the history of contagions will one day receive solutions still more simple than the one I am speaking of !! Let us throw aside the theories, that we can contradict by positive facts, but not by the vain pretext that some of their applications escape us. The combinations of nature are at all times singular and more varied than those which meet the ordinary conceptions of our minds.

One will be better convinced of what I say, if I add that several drops of a culture of our microbe, placed on bread or on meat which chickens will eat, are sufficient to introduce the disease by the intestinal canal, where the little microscopic organ-

isms develop themselves to such an extent that faecal excrements of chickens thus effected, will kill animals inoculated with them. In this manner one can easily understand the manner of propagation of the disease in chicken yards. Evidently the manure of diseased animals plays the greatest part in the contagion. And then nothing will be easier than to stop it by isolating the animals for a few days only, by washing the yard well with water, or water acidulated with sulphuric acid, which easily destroys the microbe and prevents its development, in proportion of 1 gramm of the acid to one litre of water, and by removal of the manure. All causes of contagion would be disposed of, as, during the isolation, animals already diseased would have died, so rapid is the action of the disease.

In passing always from one culture to another by the sowing of a quantity comparatively very small, for instance, by what may be carried on the point of a needle just dipped in the fluid, the repeated culture of the infectious microbe in chicken bouillon does not weaken the virulent power of the microscopical organism, nor, what is about the same, the power of its multiplication in the body of the gallinaceous. This virulence is so great, that by the inoculation of a small fraction of one drop of a culture, twenty times out of twenty death will take place in two or three days, and often in twenty-four hours.

These generalities being known, I now come to the most important facts.

By some change in the culture, the virulence of the infectious microbe can be diminished. This is the important point of this paper. I nevertheless ask the Society the liberty not to trust for the present, too far in my faith in the means which may tend to the diminution I am speaking of, so far as to reserve for a short time the independence of my investigations as well as to insure their progress.

The diminution in the virulence is manifested in the subject by a small stoppage in the development of the microbe; but at the same time the identity remains of the two varieties of virus.

In the first state, that where it is very infectious, the microbe will kill twenty times out of twenty cases; under the second it

will give rise to the disease, but not fatally twenty, times out of twenty observations. These facts have an importance easily to be understood; they allow us to judge so far (of the disease which occupies us) the problem of the possibility of a second attack. Let us take forty hens, and inoculate twenty with very virulent virus; they will die. Let us inoculate the other twenty with weakened virus; all will be sick, but will not die. Let us allow these to get well, and inoculate them with very infectious virus; this time it will not kill them. The conclusion is evident; the disease protects itself. It has the character of the virulent diseases which do not attack an organism twice. But be not blinded by the singularity of these results. All in it is not so new as might be at first supposed. They have, however, on an important point, a true and real novelty, which must be exposed. Before Jenner, (and he for a long time practiced this method,) as I have already said, people were variolized, that is, inoculated with variola, to be protected from it. To-day, in some countries, sheep are variolized to protect them from variola; bovine are inoculated with pluero-pneumonia to be protected from that disease. Chicken cholera is another immunity of the same kind. It is a fact worthy of attention, but not new in principle. The true, real novelty of the preceding observations—novelty, which gives rise to much thought in relation to the nature of virus, is that it is a question in this case of a disease, whose virulent agent is a microscopic parasite, a living being, cultivable outside of the economy. The varioloid virus, that of vaccine, glanders, syphilis, &c., &c., are unknown in this special nature. The new virus is an animated being, and the disease it gives rise to has, with virulent diseases so called, this point (so far unknown in virulent diseases with microscopic parasites): the character of protecting from a second attack.* Its existence throws, so to speak, a bridge between the ground proper of the virulent diseases with living virus, and that of the diseases with virus whose life has never been discovered.

I would not wish you to believe that the facts occur with the

* Non-recidivity.

plainness and mathematical regularity that I speak of. It would be overlooking all the variability that exists in the constitutions of animals taken at hazard from a mass of domesticated individuals, and in the manifestations of life in general. No; the very virulent virus of chicken cholera does not always kill twenty times out of twenty; but in the facts which I have seen, it has done so in the minimum eighteen times, when not in twenty. And the weakened virus does not always protect twenty times out of twenty. In my observations it has been eighteen, and once sixteen. A single inoculation is not absolutely always protective. A more certain result can be looked for with two.

If we compare these results with the great fact of vaccine with small pox, we will recognize that the weak microbe which does not kill, acts as a vaccine in relation to the microbe which kills; giving rise, in fact, to a decrease which may be called even mild, and which may protect from one which might be fatal. What would be necessary to convert this microbe of weakened virus into a true vaccine like that of cow pox? It is, if I may so express it, that it should be fixed in its special variety, and that to use it it would not be necessary to always look for it in its state of original vigor and purity. In other words, we are placed in the same doubt as that which for some time occupied Jenner's mind. When he had demonstrated that inoculated cow-pox would protect from variola, he thought it would always be necessary to look for the cow-pox of the cow. We are at present at the same point in relation to chicken cholera, with however this great difference, that we know that our vaccine is a living being. Jenner soon found that he could do without the pox of the cow. We may do as well by carrying out microbes from culture to culture. Will it then return to a very active virulence, or will this remain limited? Astonishing as they may seem, facts bring us to the second supposition. At least in the small number of successive cultures that we have made, the virulence has not increased, and consequently we may believe that we have to deal with a true vaccine. More than that, one or two experiments are favorable to the idea that the weakened virus remains such in passing in the organism of guinea pigs. Would it be so after

several cultures and several inoculations ? Further inquiries only will solve these questions.

However, we possess to-day a disease with microscopic parasites, which, notwithstanding its parasitic character, we can reproduce in such conditions that it will not recidivate. And besides, we know a variety of its virus which acts towards that disease as vaccine does toward small-pox.

Before going further I may be allowed to enter into a very interesting digression.

From the preceding remarks it results that one can easily cause chickens to be affected with cholera, and death not be a necessary consequence of the disease, or in other words, any supposable number of animals may recover after inoculation, and I do not believe that any surgical clinic has ever noticed more curious phenomena than those which are manifested in the returns to health after inoculations made in the large pectoral muscles. The microbe proliferates in the thickness of the muscle as it does in a medium of culture. At the same time the muscle becomes tumefied, hard, and white on its surface as in its depth. It becomes lardaceous, full of purulent globules, still without suppuration. The histological elements are easily broken, as the microbe which impregnate them alter and destroy them in feeding on their substance. In cases of recovery, the parasite is by degrees stopped in its growth and disappears ; at the same time the necrosed part of the muscle shrinks, hardens and lodges itself in a cavity whose lining resembles much a granulating healthy wound. The necrosed part soon forms a sequestrum so well isolated in the cavity where it is closed, that it is felt under the finger, through the skin, in the thickness of the muscle, and by the smallest incision may be easily extracted. The small wound soon closes and the muscle is repaired. Let me terminante, however, by an explanation which will, no doubt, seem very legitimate, of the fact of the protection given against a second attack of the disease. Let us observe a hen well vaccinated by one or several preceding vaccinations with weakened virus. Let it be reinoculated. What will take place ? The local lesion will be, so to speak, insignificant, relatively to that produced by the first operation. These

will give rise, the first principally, to such great alteration of the muscle that large sequestræ will be felt under the fingers. The cause of the difference in the effects of these inoculations seems to reside entirely in a great relative facility of the development of the microbe after the first inoculations, and for the last, on the contrary, in a non-development, or in a very weak one, rapidly stopped. The consequence of these facts is manifest; the muscle which has been diseased has become after its recovery and its repair, unable fully to cultivate the microbe, as if this last by an anterior culture had removed from the muscle some principle that is not returned by life, and whose absence prevents the development of the little organism. In my mind, this explanation, to which we are brought by most palpable facts, will become probably general and applicable to all virulent diseases.

The explanation that I have given of the protection against a second attack of cholera will seem so much more plausible that, if, after three or four days of culture of the microbe in a liquid medium, this last is filtrated to a perfect limped state, and if it is then sowed again after several days of proof of its limpidity at a temperature of 30 degrees, all cultivation remains impossible. Still the weight of the microbe, formerly developed, was imponderable. Remarkable fact, this filtrated, and thus sterile, liquid is far from retaining this sterility towards other microscopic organisms: for instance, it grows the carbuncular bacteridæ, and this allows us to comprehend why an organism in which a virulent disease does not recidivate, is nevertheless liable to contract a virulent disease of another nature. It would be easy to give anthrax to hens vaccinated for chicken cholera.

It would seem to me superfluous to show the principal consequences of the facts I have just presented. There are two however, which it may not be without utility to mention. First is the hope of obtaining artificial cultures of all the virus; and again, a desire to search the vaccine virus of the virulent diseases which so often have desolated, and again every day desolate humanity, and which are such a great curse to agriculture in the raising of domestic animals.

EDITORIAL

CHICKEN CHOLERA.

The believers in the spontaneity of the development of contagious diseases have found in M. Pasteur a powerful opponent, who slowly, but surely, demonstrates by undeniable proofs that the virulent properties of those affections is due to the presence of microscopical organisms. A few years ago it was his wonderful discovery of the causes of the contagious disease of the silk worm; later, the evident proof of the bacteridæ as causes of carbuncular affections; and now it is his demonstration of the ætiology of chicken cholera, an affection which destroys so many of our valuable poultry, and brings on ruin to large poultry breeding establishments.

But this last discovery goes farther. With some restrictions, justified by the limited number of experiments yet made, he shows that chicken cholera is not only due to the presence of a microbe, developing itself in the organism of the hen, as was already demonstrated by Perroncito and Toussaint, but that it can be prevented by inoculation—a fact which goes far in the prophylaxy of the disease, and which cannot escape the attention of our agriculturists. Prizes have been offered for proper means of treatment of this affection. We hope that the article which we reprint to-day will find room in the columns of our agricultural papers, and be read and put in practice by those who are engaged in the important undertaking of breeding and raising poultry. Veterinarians will, no doubt, read with interest, the long papers that M. Pasteur read before the Societe Centrale de Medecine Veterinaire, and which we reprint in full in this issue of the REVIEW.

PLEURO-PNEUMONIA.

Our readers are aware that the appointment was made some time ago, by the Commissioner of Agriculture, of Dr. C. P. Lyman, M.R.C.V.S., to investigate to what extent pleuro-pneumonia was prevailing in the Eastern States.

As soon as he was appointed, in February last, the Doctor set himself to hard work, and has no doubt well employed his time, if we can judge by the extracts from the report which was sent to us, and which we reproduce in the REVIEW.

This is, properly speaking, the first official paper that the profession has read, and the first also which presents to all the true state of affairs relating to that cattle lung disease; and when one reads it, if he takes into consideration the amount of good work done by the different State Commissions, in the shape of stamping out, and adds to it the remaining existing condition, can he wonder any longer at the anxiety expressed by our Government or that of Canada and of England.

Let now the Commissioner of Agriculture direct Dr. Lyman to make the same investigation for tuberculosis in cattle, for glanders and farey in horses, for anthrax fever—in fact for all the contagious diseases which exist more or less all over our continent.

And then, when there will remain no more doubt of the vast existence of pleuro-pneumonia in our midst, and also of the constant threat of its possible spreading amongst cattle of the plains; when it will be shown how much tuberculosis prevails amongst our milking cows, and by its presence endangers the lives of our people; when it is proved that glanders and farey are to be found daily in our stables and in the streets of our large cities, can Congress ignore any longer the dangers, and refuse the means for the establishment of the proper measures to get rid of these terrible scourges, constant sources of heavy losses to our commerce and our general wealth; can the necessity for the establishment of a National Veterinary Bureau be any longer overlooked?

NOTICE.

With the May number, the second of our fourth volume, we have mailed to our subscribers a statement of their indebtedness. As we have already stated, all surplus paid to us by subscribers being intended to be used for improvements in our publication, our friends will see the necessity of an early settlement of their

little account by sending us *Post Office order on Station G.* Gentlemen who are in arrears for three years' dues, will not receive the REVIEW after this number, unless their accounts are paid up.

TRANSLATIONS FROM FOREIGN PAPERS.

GOURME; OR, HORSE VARIOLA.

NATURAL AND IRREGULAR FORMS OF THIS DISEASE—INOCULATION AS
A PROPHYLACTIC MEANS OF ITS COMPLICATIONS.

BY M. L. TRASBOT.*

(Continued from page 27, Vol. IV.)

CONCLUDED.

A horse that has had gourme, has obtained a greater commercial value ; such is for a long time one of the most commonly admitted ideas. Every veterinarian, consulted at time of purchase, has had opportunities to find this out. There is no opinion more fully believed ; and thus the first thought of those who buy a horse, is to inquire if he has had gourme.

A popular fancy, strong as it may be, may often however, it will be granted, rest only on a simple superstition or a purely accidental circumstance. When on the contrary, it touches a material interest, there is a strong tendency to a different conclusion, and the prevailing view of the case will be more likely to rest on the solid facts of observation. And in this case, general reason finishes by showing the truth. The belief above referred to proves it. Notwithstanding the different affirmations, often repeated, even by men of a positive authority, it has never been shaken. To-day, its correctness can no longer be contested.

* Translated by A. Liautard, M.D., V.S.

It is the expression of a scientific truth, positively obtained by observation, and better still by direct experiment.

In general thesis it can be said that gourme affects an animal but once, at least in a severe form.

And again, it is not less admitted that this disease will manifest itself, almost certainly, sooner or later. Leaving aside the technical question relating to the possibility of its spontaneous development in a healthy organism, its appearance by contagion can be considered as an unavoidable fact.

Indeed, as a consequence of the numerous peregrinations to which horses are submitted by transport from breeding to raising districts and thence to great industrial and commercial centres; also by their exhibition in fairs and markets; their gatherings in greater or smaller numbers &c., &c.;—their escape from contamination is almost impossible, one day or another. Therefore, in the practical point of view, one must in principle admit that sooner or later a horse will be affected with gourme, and if a few exceptions are possible, they are so limited that they cannot be taken into consideration.

Again, it is well established, that under the form of horse-pox with a regular evolution, the disease is a mild affection, without immediate danger and without future serious sequelæ.

The solution of the problem concerning this disease, is this: so long as it cannot be avoided, to produce it at one time and even in one selected spot, so as to protect the sick ones from the operation of the influences which usually interfere with its normal progress, and thus give rise to the manifestations more or less serious, already pointed out.

The true means of effectually securing this result is to inoculate according to the directions I am about to indicate.

To do it, one might take the virulent liquid directly from a variolous horse. In raising the epidermic covering of a single pustule at the period of secretion, one may obtain enough material for several inoculations. I have often operated in that way, and always successfully, when of course, I have done it on animals not deprived of receptivity by a preceding attack of the disease. The transmission from horse to horse is consequently

a simple, easy and certain means of developing the disease in its regular form.

Still, it is not, I believe, the best; first, on account of the difficulty which may be often met, of not having at a given time an animal ready to give the material for inoculation, and again, but specially, because the horse may also possess the virus of glanders, whose introduction into a healthy organism would be followed by fatal results: just as physicians have sometimes objected to direct vaccinations from arm to arm, for fear of inoculation of the most serious sequelæ, so the veterinarian must fear the possibility of communicating glanders with horse-pox.

This accident would not be common, it is true, but if it is possible, this is reason enough to guard against it; besides, it is easy to obtain the vaccine matter of a child, which does not present the same danger. I have often used it in my experiments, and it has given me, it is superfluous to say, the same result as the *pure* liquid taken directly from the horse. It ought to have been so, for the vaccine is in reality the equine virus returning in its proper organism. And the certainty that it gives of avoiding the possibility of a glandorous inoculation, renders it preferable in the majority of cases.

Still, one might ask if it is not necessary to know well where the vaccine matter comes from, and if there would not be danger of its being infected with syphilis. Is syphilis inocutable to the horse? Is it the origin of dourine?* This is a question which cannot be answered to-day. Waiting for the solution of this problem, the doubt in which we are left should deter us from accepting, before transmitting it to the horse, any virus whose purity is in any degree doubtful.

For a certain number of experiments that I made, I have used the vaccine deposited at the Academy of Medicine, by the Commission of Vaccinations, and whose guaranteed quality gave me a perfect security. For others, I obtained it from cows and calves to which I first gave it. This last is a mean which can be used if there is any doubt as to the quality of the virus. This, in passing

* French name for Maladie du Coït.

through the bovine organism, would free itself of all dangerous mixture, as neither syphilis or glanders have as yet been communicated to animals of that species. One may thus avoid all possibility of danger; it is an easy thing, as cows or calves which are good subjects for the cultivation of the virus, can always be readily found.

The liquid obtained, where is it best to apply it?

We have seen in preceding papers that in the horse the variolous eruption is often confluent near the point of entrance of the virus. And we also know that if the pustules are irritated by rubbing or by the contact of irritating fluids, they become inflamed, suppurate, ulcerate, and are accompanied with suppurating lymphangitis, sometimes serious.

Consequently, to avoid these complications, one must look for a region where the action of these irritating causes is to be feared as little as possible. The extremity of the head and the legs, for these reasons, do not answer. After many trials it has seemed to me that the lateral faces of the neck answered the purpose well. On account of its somewhat shallow form and of its situation, rubbing is difficult and even impossible if protected by cradle. And if the confluence of the pustules takes place, no serious condition can follow. I shall therefore until better informed, use that region.

One will make three or four punctures on each side, about five or ten centimeters apart, and placed in line a little above and parallel to the superior border of the mastoido-humeralis. In proceeding thus, I have not seen excessive inflammation nor ulceration of the pustules follow. I do not say that they will never take place, but if they should, the complication likely to follow would never prove fatal.

Besides the question of the place where the inoculations ought to be performed, that of the proper age and most advantageous condition of weather ought to be considered. As far as this goes, there is no need to take into consideration the idea, so often repeated, that gourme could not develop itself properly as a critical disease in very young animals. We know now what weight should attach to this opinion. From the first months following

birth the disease may develop itself and run its course regularly or not, and in both cases protect the animal thus affected for a later period.

Still, perhaps we should not, without hesitation inoculate very young subjects, on account of their lesser power of resistance to the disease. This question, I take the opportunity to say, cannot be actually or positively decided, and will not be unless further comparative experiments are made. It may be possible that, with the object of preventing all accidental contamination, the effects of which are ordinarily most dangerous, sucking animals will be inoculated. However, from the facts, very few, it is true, positive as they are, which I have collected, I am assured that at the end of the first year animals can safely be operated upon. At that period the loss of time for work does not need to be considered; a rather important question in an economical point of view.

As always during the course of the disease, it is prudent to keep the animals at rest and in good hygienic condition, so as to protect them from exposure to cold or other influences likely to interfere with the pustular eruption, and give rise to the appearance of respiratory inflammations more or less serious. There may be, after all, great advantage in inoculating colts before they are broken for work.

As to the time of the year, this seems to me to be of little interest. It is only when one operates upon animals living constantly out of doors that good weather is to be preferred. This is not the most general case. Horses, especially in our days, are kept more or less in-doors, and it is easy to keep them so during the whole duration of the disease. I am satisfied then, that inoculation can be performed in all seasons of the year. I have often done it without noticing the slightest accident.

In all cases after inoculation performed upon very young animals not working yet, or upon adults, it is good to keep them at rest, to feed them moderately and to protect them from all atmospheric influences until the period of dessication of the pustules. With these precautions, after a slight fever, the pustules make their appearance more or less abundantly on the whole surface of the body, from the fourth to the sixth day after the operation, and

almost immediately after the signs of general health show themselves, signs which do not disappear if nothing comes to interfere with the course of the disease, until this has reached its complete resolution.

I most advise veterinarians practising in raising districts, and all in fact, to practice that inoculation as a prophylactic mean of the complication of gourme, satisfied as I am, that by it many losses will be avoided. As to the treatment, I have nothing to say. It would require more than I intend for the present to give. Besides, the indications do not vary much, whether angina, bronchitis or pneumonia are of gourmy nature or not.

I will, however, call your attention to one point of internal therapeutics, in the treatment of bronchitis and pneumonia.

Ordinarily this treatment has for its fundamental basis preparations of antimony—tartar-emetic in doses of five or ten grammes, or kermes in doses of twenty per day are usually prescribed. This practice is sanctioned by years of experience. But can nothing better be done? Some gathered observations have allowed me to decide in the affirmative.

I have in the preceding pages shown that chronic roaring is a common sequel of bronchitis, and possibly also of pneumonia.

My theory of its mechanism of production has suggested to me the propriety of adding to the accepted modes of treatment of these diseases, the internal administration of iodide of potassa, in rather large doses.

In 1874, M. Zundel had already broached the idea that chronic roaring might be due to the pressure upon the inferior left laryngeal nerve, by the lymphatic glands, enlarged at the *entrance of the thorax*, and then recommended arsenical and iodurated preparations.

As I was about publishing this paper, I received from him a letter stating that he had by this treatment obtained excellent results.

I have myself, during several years, often given iodide of potassa, not as a curative, but only as a prophylactic agent.

At first I gave it with the kermes or tartar-emetic for acute bronchitis; I now give it alone, with no less success. Experience

has shown me that to diminish the strength of the disease, to facilitate the discharge, and to shorten the duration of the attack, this drug is better and more powerful than any other I used.

What renders it more valuable, is the fact that it seems to prevent roaring. I have now more than ten observations gathered from cases of very acute bronchitis, at the clinic of the school at Alfort, or from outside practice, which in all probability, in respect to some of them at least, would have been followed by this complication, and which have rapidly recovered, without leaving any marks of their existence, by the treatment with iodide of potassa, and with simple fumigations.

I know this number is too small to be positive. I myself, do not consider it as sufficient. But, still, all things taken into consideration, it is not without a certain value. And for this reason I wish to recommend it. According to the size of the animals I give from eight to twelve grammes of the iodide of potassa for four or five days, then diminish it. I add to this simple fumigations. Nothing more. Of course I do not wish to throw aside the old established treatment.

As to the effect of this drug in pneumonia, I have not yet had sufficient experience to speak knowingly.

As to the mode of action in bronchitis, it is a subject which I propose to treat at a future time.

CORRESPONDENCE.

To the Editor of the American Veterinary Review.

Sir: I desire to bring before your notice certain facts in regard to the position of Veterinary Surgeon in the United States army, as I find them.

In 1863, by virtue of act of Congress, promulgated in General Orders No. 73, 1863, the position of veterinary surgeon in the U. S. army was created, allowing one veterinary surgeon at \$75 per month to each regiment of cavalry, then six regiments. In 1866 four new regiments were added to the established number, by act

of Congress, published in G. O. 56 and 66, but for each of those four new regiments, two veterinary surgeons were allowed, one at \$100 per month, and one assistant at \$75 per month.

When Congress passed that act, it must certainly have occurred to them that one veterinary surgeon for each regiment was insufficient, otherwise where was the necessity of allowing two for each of the new regiments? Do not the horses require as much attention, and are they not equally as many, and as much scattered amongst the different posts, as those of the new regiments?

It is over 13 years that this unequal assignment has existed, and yet no alteration has ever been made. It may have been overlooked, with many more small details in the economy of the army, but taking into consideration that the item for the purchase of horses, etc., for the army is a considerable one in the appropriation bill, and that a great saving could be made by the right treatment of diseased horses by skilful surgeons, it is my opinion that two veterinary surgeons in a regiment, or even one at every post where there are a considerable number of public animals, say four companies of cavalry, or the same number of other public animals, could, by skilful treatment and economical use of medicines (now wasted in the different companies of the regiment), save sufficient to reimburse the Government for the expenses incurred in this employment.

In regard to the position itself, I desire to remark that G. O. 73, 1863, allowing veterinary surgeons for the regiments, says, "one veterinary surgeon to rank as Sergeant Major." In the table showing the organization of the army of the U. S., (Army Register, 1878,) I find, being recognized as civilians, these veterinary surgeons are excluded from the organization table. If belonging to the regiment as part of the regimental organization, and ranking as Sergeant Major, why is the usual rations and clothing allowance withheld from us? If civilians, why are we not hired and paid by the month in the Quartermaster's Department, as all other civilian employees, or put on the same footing as contract doctors?

It is clear to me, as it must be to any one reading this article, that an irregularity exists, which, if cleared up, would induce

many young graduates of the profession to offer their services to the U. S. army. G. O. No. 36, 1879, states that all candidates for the position must be graduates of a veterinary college; this includes that he must have passed a strict matriculation examination, and attended college not less than three terms. They must be above the average in the profession, as the same orders compels them to give lectures on anatomy and pathology, and to instruct the farriers, the blacksmiths, etc. To do this he must be a theoretical and practical veterinary surgeon in the full sense of the word. Why then should the veterinary surgeon not have a certain standing in the army? I think the profession is worthy of holding a commission, as they do in all European armies.

VETERINARY SURGEON.

SOCIETY MEETINGS.

MONTREAL VETERINARY MEDICAL ASSOCIATION.

The regular fortnightly meeting of the Montreal Veterinary Medical Association was held on Thursday evening last, the Vice-President, C. J. Alloway, V. S., in the chair. Mr. Donald Campbell regretted that, owing to ill health, he had been unable to prepare his promised paper, but hoped to do so at some future meeting. Mr. M. S. Brown then described a very interesting and unusual monstrosity of a calf he had recently examined. Mr. E. J. Carter was next called upon to read his paper on rabies, which proved very interesting and instructive. He first glanced at the history of rabies, showing that it has been known from the earliest times; next, the distribution of it occupied his attention. It occurs in nearly all parts of the world, being particularly prevalent in Western Europe. Recently it had almost exterminated the Esquimaux dogs of Greenland. Australia, New Zealand and Tasmania are among the few fortunate locations where it is unknown. Its nature and the cause which produces it were then fully discussed. Its nature is not fully understood, but that it is a disease of the nervous system there is little doubt. Many

causes have been assigned to it, such as hot weather, change of climate from a cold to a hot, etc.; but statistics prove that it occurs oftener in the winter than summer, and that native dogs are as liable to it as those imported. The symptoms of the disease were graphically described, and the speaker impressed upon his hearers the necessity of being able to distinguish between it and an attack of epilepsy. Many dogs, especially pet dogs fed upon meat, were subject to epileptic fits, and sometimes excited in the minds of their owners the fear that they were mad. He had no doubt many valuable dogs had been destroyed from such a mistake. It was commonly supposed that mad dogs were afraid of water. Such is not the case. Mad dogs are often very thirsty, and will attempt to drink, but owing to paralysis of the muscles of the throat are unable to swallow. Cases are also on record of mad dogs swimming across streams in order to attack men or animals on the other side. Fear of water is sometimes, but not always, a symptom of the disease in man, and the name *hydrophobia* should, therefore, be discarded as a misnomer.

A lively discussion followed, and the chairman gave an account of some interesting cases which had come under his notice, not of rabies, which he had never seen, but of the effects produced on the minds of nervous persons when bitten by a dog they supposed to be mad. The disease, he was happy to say, was almost entirely unknown in Montreal and Canada generally, although cases of simple epilepsy sometimes gave rise to sensational rumors.

A vote of thanks to the essayists was passed, and the meeting adjourned. (*From the Montreal Gazette.*)

COMMENCEMENTS.

ONTARIO VETERINARY COLLEGE, TORONTO, CANADA.

The closing exercises at this institution took place on Thursday and Friday in the large museum of the college. A large number of students presented themselves for examination. The large proportion of successful candidates speaks well for the thoroughness and efficiency of the instruction given. The Board of Exam-

iners was composed of the following gentlemen :—Messrs. Coleman, Caesar, Duncan, Wilson, Sweetapple, Elliot, Cowan, McNaught and Dr. Thorburn, who, after a most rigid examination, awarded diplomas to the following gentleman :—

DIPLOMAS.

S. Brenton, Belleville ; A. Bell, Sharpton ; W. Burt, Simcoe ; J. Burnett, London ; G. Dunphy, Salford ; G. Coulter, Islington ; P. Z. Colsson, Mobile, Alabama, U. S. ; J. B. Fretz, Pennsylvania, U. S. ; F. L. Groff, Ohio, U. S. ; H. G. Hawley, Brantford ; Thos. Meredith, Jamestown, N. Y. ; J. Loughman, Montreal ; B. B. Page, Illinois, U. S. ; P. Stevenson, Aurora ; R. Riddle, Cobourg ; D. H. McFadden, Allanford ; U. Springer, Waterloo ; C. P. Smith, St. Marys ; J. Taylor, St. Catherines ; J. P. Whitehead, Deleware ; B. Way, Belleville ; L. A. Severcool, Ohio, U. S. ; P. Shalliol, Ohio, U. S. ; E. P. Westell, Arkona ; D. Young, London.

Primary—G. Bell, Westbrook ; G. Howell, Carlow ; J. Donnelly, Palmerston.

PRIZE AND HONOR LIST.

Seniors.—*Pathology*—Silver Medal, G. W. Dunphy. Honors —W. Burt, H. G. Hawley, J. Loughman, B. B. Page, U. Springer, C. P. Smith, P. Stevenson, B. Way, J. Whitehead.

Chemistry—First Prize, C. P. Smith ; second, U. Springer ; third, J. Whitehead. Honors, G. Coulter, B. Way.

Entozoa—First Prize, G. W. Dunphy. Honors, C. P. Smith, U. Springer, J. Taylor, B. Way, J. Whitehead.

Anatomical Preparations—Prize, P. Z. Colsson.

Anatomy—Silver Medal, J. Whitehead. Honors, S. Brenton, W. Burt, P. Z. Colsson, G. Dunphy, J. Loughman, C. P. Smith, U. Springer, P. Stevenson, B. Way.

Physiology—First Prize, C. P. Smith ; second, G. Coulter, G. Dunphy, J. Whitehead. Honors, B. B. Page, R. Riddell, P. Shalliol, E. P. Westell.

Materia Medica—First Prize, C. P. Smith, B. Way, equal. Honors, G. Dunphy, B. B. Page, P. Stevenson, U. Springer, D. Young.

Gold medal for the best general examination—C. P. Smith St. Mary's. Honors, W. Burt, G. Dunphy, B. B. Page, U. Springer, P. Stevenson, B. Way, J. Whitehead.

JUNIORS.—*Physiology*—First Prize, J. A. Dell; second, W. E. Langford.

Pathology—First Prize, J. S. Butter; second, J. A. Dell. Honors, D. L. Devone, S. L. Honiford, — Logan, W. E. Langford, S. Maguire.

Chemistry—First Prize, J. A. Dell. Honors, W. E. Langford, A. Maguire.

Anatomy—Silver Medal, J. A. Dell. Honors, J. S. Butter, A. Logan, A. Maguire, — Shaw.

A numerous company assembled to witness the presentation of the above prizes, which took place in the museum on Friday morning. At the conclusion of the exercises, Prof. Buckland, on behalf the Board of Agriculture, stated that in his department, breeding and management of stock, the following prizes were awarded:—G. W. Dunphy, books to the value of \$20; J. W. Litehead, \$15; B. Way, \$10. He also said that he had the authority of the Commissioner of Agriculture for saying that that gentleman sincerely regretted his unavoidable absence. He expressed his full confidence that, great as had been the success of the college in the past, it would be greater in the future.

MONTREAL VETERINARY COLLEGE.

Yesterday afternoon the prizes and diplomas gained by the students at the Veterinary Medical College were presented. At four o'clock the lecture-hall of the College on Union Avenue was well filled with examiners, students and their friends. Among those present we noticed Hon. Lucius H. Beaubien, M.P.P., Prof. McEachran, Principal Dawson, Messrs. A. W. Ogilvie, D. Morrice, J. M. Browning, Hon. Gaudet, Vice-President Council Agriculture; S. W. Blackwood, John L. Gibb, A. Sommerville, Dr. Osler, Dr. Leclerc, Dr. Bell, Dr. Alloway, F. S. Billings and W. Bryden, of Boston, and G. H. Barnatt. The Hon. Mr. Beaubien acted as Chairman. On the meeting being called to order, the Chairman, in brief terms, addressed the students and congrat-

ulated them on the success which they had attained in their studies. He called their attention to the fact that those who passed a successful course in the Montreal Veterinary College and received their diplomas, were looked upon all over the world, and more especially in Canada and the United States, as V. S. who understood and were well grounded in the work of their profession. The College had become so useful that not only private individuals, but he was glad to say the Governments of the country were recognizing the good, faithful and hard work which Dr. McEachran was performing. (Cheers.) He wished the College greater prosperity in the future, and trusted next year the students would be double the number. (Cheers.) He had now much pleasure in presenting the prizes to the several successful competitors. The following are the names of the winners and also the graduation class of 1880:

THIRD SESSION.

Best General Examination.—1st prize, silver medal, Mr. William McEachran, Montreal; 2d prize, A. P. Hinkley, Buffalo, N. Y.

Anatomy.—1st prize, Mr. Wm. McEachran, Montreal.

Materia Medica.—1st prize, Mr. Peter Cummins, Quebec.

SECOND SESSION.

General Pathology.—1st prize, Charles H. Ormond, Milwaukee.

Anatomy.—1st prize, Mr. Charles H. Ormond, Milwaukee.

Materia Medica.—1st prize, Mr. Fred. Torrance.

FIRST SESSION.

Anatomy.—1st prize, Mr. Walter Wardel.

Best Practical Examination (medalist excluded).—1st prize, a complete case of instruments, presented by Mr. David Morrice, won by Wm. Jakeman, Boston, Mass.

SENIOR CLASS.

French.—1st prize, Joseph Page, Lotbinere.

GRADUATES.

Wm. McEachran, Montreal; Wm. I. Akerman, Boston; N. P. Hinkley, Buffalo; A. W. Harris, Ottawa; Mathias S. Brown,

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Montreal; Peter Cummins, Quebec; Joseph Page, Lotbinere.

The following gentlemen re-registered during the past session, viz.: M. S. Brown, Montreal, P. Q.; William Jakeman, Boston, Mass., U. S.; William McEachman, Montreal, P. Q.; John S. Thomas, Roxburgh, Mass., U. S.; Joseph M. Skally, Boston, Mass., U. S.; Alex. Glass, Philadelphia, Pa., U. S.; Paul Paquin, St. Andrews, P. Q.; Richard Price, Montreal, P. Q.; Chas. H. Ormond, Milwaukee, U. S.; Hilaire Bisaillon, St. Valentine, P. Q.; John Chandler, Coaticook, P. Q.; Wm. M. Dundon, Salem, N. Y., U. S.; Fred. Torrance, Montreal, P. Q.; N. P. Hinkley, Buffalo, N. Y., U. S.; N. A. Trudel, St. Genevieve de Batiscan, P. Q.; P. F. Labelle, Ste. Dorothée, P. Q.; Walter Wardle, Montreal, P. Q.; H. Jolicoeur, Montreal, P. Q.; Alex. W. Harris, Ottawa, Ontario; Edward J. Carter, Montreal, P. Q.; Peter Cummins, Quebec; Jno. B. Green, Yellow Springs, Ohio, U. S.; Piere Gadbois, Terrebonne, P. Q.; Benj. D. Pierce, Springfield, Mass., U. S.; T. H. Bergeron, Bord a Plouffe, P. Q.; Donald E. P. Campbell, St. Hilaire, P. Q.; Joseph Pagè, Lotbiniere, P. Q.; Oliviere Maisoneure, St. Francois de Sales, P. Q.; Henry Quimby, Rochester, N. Y.; Andrew Metcalfe, Hudson, P. Q.; J. B. Caverhill, Montreal, P. Q.; D. A. P. Watt, Montreal, P. Q.

The following passed in the *English Classes* in

Botany.—Prof. J. W. Dawson, LL.D., F.R.S., &c., McGill University, viz.: John Chandler, Walter Wardle, Jno. M. Skally, Alex. Glass and C. R. P. Campbell.

Physiology.—Prof. Wm. Osler, M. D., M.R.C.P., London, McGill University, viz.: E. J. Carter, B. D. Pierce, Jno. B. Green, R. Price and C. H. Ormond.

Chemistry.—Prof. G. P. Girdwood, M. D., McGill University, viz.: B. D. Pierce, E. J. Carter, C. H. Ormond, R. Price and John B. Green.

Materia Medica.—James Bell, M. D., C. M., Lecturer, viz.: Fred. Torrance, E. J. Carter, Jno. B. Green, B. D. Pierce and R. Price.

In the *French Classes*:

Botany.—Prof. A. B. Craig, M. D., Victoria College, viz., Paul Paquin, P. F. Labelle and Piere Gadbois.

Physiology.—Prof. G. O. Beaudry, M. D., Victoria College, viz.: Hilaire Bisaillon, N. A. Trudel and T. H. Bergeron.

Chemistry.—Prof. E. D. D'Orsenneus, Victoria College, viz.: Hilaire Bisaillon, N. A. Trudel and T. H. Bergeron.

As each of the prizemen came up for his well-won honors, his fellow students gave vent to their pleasure in loud applause.

Mr. M. F. Billings, of Boston, was called upon by the Chairman to address the students. He said that he felt highly honored at being present, and had to thank his friend, Dr. McEachran, for giving him that pleasure. He confessed that when he started for Montreal to assist at the examinations of the V. C. he was rather sceptical of the results in consequence of his experience in his own country, but he was glad to say that his scepticism had all fled, for such an examination as the students of the Montreal Veterinary College had passed did honor not only to themselves but also to those to whom was intrusted the instruction. (Cheers.) He was glad to find the students were so well up in their studies, and that they understood the main thing in Veterinary Surgery, that was, the nature of diseases. He was pleased, indeed, to find so high a standard aimed at in the College, and trusted those now graduating would do all in their power to uphold the College and profession. (Cheers.) He was so well pleased with everything that had come under his notice that he wished it understood that he would be one of the three to give a prize next year for the best student in General Pathology. (Loud cheers.)

Principal Dawson was now called, and was received with warm applause. He remarked that it gave him great pleasure to attend the examinations of the V. C., although his time was well taken up with the examination at McGill; still, his sympathy for the good work that was being carried on in the V. C. was such that he always managed to spare a little time to be with them. (Cheers.) He was in a measure closely identified with them, for their profession was, in a measure, much in sympathy with science. His sympathy was more with those who studied the anatomy of the lower animals than the human, from the fact that the former were, from the nature of things, unable to say where or what was the place or nature of their disease. The highest

scientific skill, he thought, should be sought after to alleviate the sufferings of the lower animals. Again, in the opening up of our country, no profession, he thought, was going to assist it more both pecuniarily and for the benefit of stock raising, than the profession he was glad to see so many of them had adopted. (Cheers.) He was glad to see also that a higher class of students were coming up every year for the profession. Many of them he knew personally, for they were studying botany in his class at McGill, and he was glad to say that they were among his best pupils. (Cheers.) He then counseled the students graduating to also take up the study of agriculture, which was much needed in this Province, for good agriculture was fundamental to good stock raising. The learned doctor, after passing a high compliment on the stiff examination and the proficiency of the teachers, wished the prizemen and graduating class every success. (Loud cheers.)

Mr. D. Morrice, in a few words, expressed his pleasure at being present and witnessing such progress. He at the same time paid a high compliment to the abilities and careful training which the students received at the hands of Dr. McEachran and his assistants.

Dr. McEachran on raising was cheered to the echo. He said that he embraced the present opportunity to offer his thanks to the gentlemen present for their many kindnesses and the assistance which he had always received from them. It was something he was proud of, that with small beginnings, his arduous labors were bearing good fruit. His students were of a class that could not be surpassed by any V. C. on this continent, both in their training and intercourse with their teachers. (Cheers.) It was consoling for all the hard work during the course to hear such compliments paid his pupils by such gentlemen as Principal Dawson, Messrs. Billings and Morrice. The College was increasing yearly in students. Fifteen years ago a veterinary surgeon here was looked down upon, was called a horse doctor, but now all was changed, and the profession was an honorable one—(cheers), and was rapidly developing all over the land. It was felt in every branch of industry. The speaker then referred to

the large immigration that might be looked for this year from European countries, in consequence of the ravages by contagious disease among the cattle, and he was glad to say that indirectly the Montreal Veterinary College would have something to do in the matter, for Canada was known throughout the world as having the most complete quarantine cattle-regulations, and was comparatively free from all contagious diseases. He (the speaker) again expressed his thanks to the Council of Agriculture and to Principal Dawson for their assistance—(cheers)—also to the Dean and Medical Faculty of McGill—(cheers)—who, on every occasion, gave a willing, helping hand. He also offered his thanks to those gentlemen who had kindly come from a distant country to assist them. Mr. Billings, who had passed his college course at Berlin, Germany, and had been through all the best V. Cs. in Europe, had been of great assistance, and his offer of a prize was thankfully accepted. (Cheers.) The speaker then bade his pupils good-bye, and wished them every prosperity.

Mr. A. W. Ogilvie also addressed the students in a few brief words, reminding them that their profession was one that was bound to exert a great influence on the development of the Northwest territory.

The proceedings came to a close with cheers for the Chairman and Professor.

THE DINNER.

In the evening the annual dinner, which celebrates the closing of the College, came off at the St Lawrence Hall, and was largely attended by the professors, graduates and students, besides friends of the College. Among those present we noticed Mr. J. M. Browning and Dr. Leclare, respectively ex-president and secretary of the Council of Agriculture, Messrs. E. A. Barnard, editor of the *Journal of Agriculture*, and Richard White, of the *Gazette*, Professor Billings, Boston, and Professors Ross, Girdwood, Osler and Roddick, of McGill University. Principal McEachran graced the chair.

After the dinner had been disposed of, Principal McEachran proposed the customary toasts—"The Queen" "The Governor-General," and "The President of the United States."

"The Council of Agriculture" was replied to by Mr. J. M. Browning, in a speech of some length, in which he bore testimony to the high character of the Montreal Veterinary College, the close connection which exists between the veterinary science and successful agriculture, and the desire of the Council to assist, as far as possible, in sustaining the College.

The Chairman proposed the toast of "McGill University," and in doing so gave that institution the credit of extending to the Veterinary College a measure of assistance without which, with its restricted resources, it would have been impossible to maintain it. The principals and professors of McGill have, by providing lecture rooms and lecturers on special subjects, contributed largely to the success which has attended the efforts to make the Montreal Veterinary College the best institution of the kind in Canada.

Professors Ross, Girdwood and Roddick, suitably responded.

"Examiners and Graduates" was replied to by Professor Billings, of Boston, in a speech which combined the humorous with the instructive. In his remarks to the graduates and students, he said that when they went forth from the College they had only begun to learn the science of veterinary surgery, and unless they made it a life study, profiting by each day's experience, and by close observation and investigation, they need never hope to attain eminence in the profession which they had chosen. Mr. W. Brydon, of Boston, also spoke to the same toast.

"The Graduating Class" was honored by Mr. Wm. McEachran, one of the graduates.

Dr. McEachran proposed "The Agricultural Interest of Canada," which Mr. Edward A. Barnard responded to in fitting terms.

"The Under-Graduates," was proposed by Dr. Leclerc, and replied to by Mr. E. J. Carter.

Toasts to "Dr. McEachran," "Dr. Osler," and the "Press," the latter acknowledged by Mr. Richard White, of the *Gazette*, followed in the order named.

The health of "The Ladies" brought one of the most successful dinners ever given under the auspices of the Montreal Veterinary College to a close, and the company broke up at about midnight.

EXTRACTS FRON FOREIGN JOURNALS.

SIMPLE MODE OF SURGICAL TREATMENT FOR PURULENT COLLECTIONS OF THE SINUSES.

M. Friez recommends a modification in the classical operation for cases of purulent collection of the sinuses. Formerly practised by M. Thiebaut, this consists in making a very small opening about two centimetres above the zygomatic crest, and three centimeters from its inferior extremity with a small drill, the bone having been exposed by a crucial incision, and the closing of the hole made, being prevented by the insertion of a small tent of oakum, the sinuses being afterwards washed away with blood-warm water first, and later with glycerine and water in equal quantities, and slightly carbolized. These injections are made two or three times a day. By this treatment Mr. Friez claims: First—A rapid and complete recovery. Second—The possibility of working the animal while under treatment. Third—to avoid large wounds, always unpleasant to the eyes. Fourth—No need to throw the horse down to perform it. Fifth—An easy after treatment.—*Recueil de Medecine Veterinaire*.

INTERMITTENT LAMENESS CAUSED BY EMBOLISM—RECOVERY.

BY MR. TH. VIOLET.

First Case.—A stallion, 9 years old; has worked regularly since he was bought—about one month. One morning he is found lame in the off hind leg; the lameness increases rapidly by work, and he is returned to the stable; one hour afterwards he is entirely well, and moves perfectly well. Returned to work, the lameness reappears. When visited by Mr. Violet, the difficulty was brought on by exercise; the leg dragging on the ground; the extensor muscles of the phalanges seem powerless; the animal rests on the fetlock, and the anterior face of the phalanges and of the foot. The physiognomy of the horse is peculiarly anxious; nostrils largely dilated; the respiration accelerated; the body

covered with abundant perspiration. Returned to his stable with difficulty, the animal throws himself down and remains in that position for half an hour, when he gets up and goes to eating, apparently entirely relieved. Examined then, nothing special can be detected ; rectal examination reveals a normal condition of the large arterial trunks. A diagnosis of embolism of the anterior tibial was made on account of the absence of other lesions on the whole extent of the leg ; the peculiar characters of the lameness, especially its intermittence, and the condition of the extensors of the phalanges.

The treatment consisted in bleeding at both saphena veins ; a long seton at the gluteal region, and a strong liniment over the anterior tibial region, to be removed when severe counter irritation is obtained. Internally 100 grammes of sulphate of soda every day. Walking exercise of five minutes, increased every day by the same length of time. Two months later the animal returned to his work and has done well since.

Second Case.—An Anglo-norman mare is taken lame whenever she goes to work; her perspiration was then abundant, her respiration accelerated ; her actions irregular, for want of proper action of the near anterior leg. In this the flexion of the inferior joints, especially of the knee, is deficient, the foot drags on the ground, the rest is made on the plantar surface of the foot and is not painful. Minute examination of the leg reveals nothing wrong. Diagnosis embolism of the cubital or posterior radial artery. The treatment consisted in slow exercise, stimulating frictions on the forearm, and was followed two or three months after, by a radical recovery.—*Journal of Zootechnie.*

EXTIRPATION OF THE CORD OF THE CERVICAL LIGAMENT IN THE HORSE.

BY MR. BRUN.

A handsome percheron had an extensive diseased condition of the neck at the ligamentum nuchae towards its upper third, which had been treated by injections of Villate solution, free

incision, drainage by setons, etc., all without satisfactory results. The case was growing worse; the swelling had increased; fistulous tracts formed; counter openings and continued irrigations gave but temporary relief. The necrosed cord was always felt as a hard, rough surface, rebellious to every cicatricial work.

The excision of that part of the cervical ligament and of that anterior to it as far as the occipital bone, was recommended as radical cure. All the mane being trimmed off, an incision was made on the median line, from a little behind the diseased part of the cord to the occipital; the cord of the ligament was then entirely cut away, and all diseased yellow elastic tissue removed; the wound was dressed with perchloride of iron, supported by a dressing with heavy quill sutures. The process of repair was established in a few weeks, except near the occipital bone, where a short stump of the cord had remained, and which had to be excised afterwards. No bad results followed, no great deformity—the animal being sold some months afterward for fourteen hundred francs.—*Archives Veterinaires.*

CASE OF DEATH AND RETENTION OF A FœTUS—SUDDEN DEATH OF
THE COW.

BY E. S. HERWENS, M.R.C.V.S.

A cow, about four months in calf, had been exposed to a terrible thunder storm. The next day she was found feverish, with no appetite, the bowels constipated, the milk reduced in quantity, with a slight discharge from the vagina, but no parturient pains. A mild aperient, a febrifuge draught was given, and she seemed to rapidly recover. Some three weeks later she presented the same condition, less the manifestations of the genital organs. She received the same treatment again, improved, and began to have a stinking discharge from the vagina.

Attempts having been made to introduce the hands per vaginum to remove the fœtus, without success, antiseptic injections were ordered.

A generous diet was ordered; vegetable tonics with antiseptic given. The appetite improved, but she gradually wasted and dropped dead about three months afterwards.

At post mortem, lungs, heart, intestines and kidneys were found healthy; the liver twice its natural size, and filled with hundreds of small abscesses. The uterus contained a mass the size of a man's fist, the remains of the skeleton of the foetus. The coats of the uterus thickened.—*Veterinarian.*

NATURE OF A TUMOR OF THE SPLEEN IN THE DOG.

BY JOHN W. STEEL, M.R.C.V.S.

A bull terrier bitch, advanced in age, supposed to be pregnant, with an abdomen inconveniently large, quite fat, and had never been sick, presented on examination of the abdominal walls, a large tumor, which was diagnosed to be of ovarian nature. When taken up, the tumor proved to be five inches long by four wide, and three thick—it weighed over one pound and three-quarters; it was somewhat ovoid, apparently cystic, and multilocular, having part of the great omentum appended to it, and a considerable portion of spleen directly continuous with its substance. On section, it was found to consist of straw-colored deposits in the parts nearest to the spleen substance, but on the farthest side, of recent accumulation of coagulated blood. The tumor evidently consists essentially of a number of blood clots, descending the natural venous sinuses, and intralocular spaces of the spleen. The straw-colored parts seem as if the result of extravasation some short time before, but the red parts are evidently quite recent, and serve to illustrate the true nature of the mass. This seems to account for the fact that the appended portion of the spleen is quite healthy, which also proves the absence of lymphadenomatous or tuberculous condition.—*Veterinarian.*

PLEURO-PNEUMONIA.

EXTRACTS FROM THE REPORT OF DR. C. P. LYMAN TO THE
COMMISSIONER OF AGRICULTURE.

THE DISEASE IN CONNECTICUT.

In the course of my investigations in Connecticut the following facts were gleaned :—An outbreak of contagious pleuro-pneumonia, says Mr. E. H. Hyde, chairman of the Commission, had occurred at Greenwich, occasioned by exposure to a calf which had been brought from New York and placed in the herd of Mr. B. Livingston Mead. This farm is located on the State line, a part being in the State of New York and a part in Connecticut. This herd consisted of twenty head. The buildings are in Connecticut. From seven to nine animals have died, the last one about the 18th of March, 1879. The remainder are unaccounted for. These animals were at one time examined by Professor Law.

The herd of Daniel M. Griffin, on an adjoining farm, contracted the disease from Mr. Mead's herd. He had twenty-seven head, eight of which died. With the exception of one animal, Mr. Griffin sold the remainder of the herd to dealers in New York for slaughter. The one he retained remained with his tenant and will soon be slaughtered on the place.

Joseph B. Husted, of Greenwich, took some cattle to New York for slaughter, among them two cows. They were all landed at the infected Sixtieth street yard. The cows were not sold, and, after some hesitation on the part of the New York Commission, they were allowed to be returned to Connecticut, the Commissioners of the last named State being notified of the fact. The State authorities at once ordered them quarantined, but before the letter reached Mr. Husted he had sold them, and they are still untraced. They were taken away from Greenwich on or before July 11, 1879.

Mr. Curtis Judson, of Watertown, near Waterbury, keeper of the Gramercy Park Hotel, bought two cows from Mr. Hedge, a dealer in New York, and placed them in an excellent herd of his

own at Watertown. They proved to be affected with contagious pleuro-pneumonia, and soon infected the herd with which they had been placed. The herd was quarantined, by order of the State Commissioners, but the owner on the 8th of March, 1879, broke quarantine and took them to New York. This fact coming to the knowledge of the authorities in time, they were enabled to be in New York on the arrival of the animals, where they were at once killed by order of the New York Commission. Mr. David D. Hawley, of Danbury, had an outbreak of disease in his herd on October 27, 1879. They were visited by Dr. Hopkins of New York, who made an autopsy of a calf and pronounced the disease tuberculosis. The calf came from New York, and had been with the herd but a month.

Mr. Porter, of Waterbury, had an outbreak among his cattle on the 18th of November, which the attendant veterinarian feared might prove to be contagious pleuro-pneumonia. The herd was visited by the State Board on November 18, and the decision arrived at was that the animals were suffering simply from sporadic disease. No post-mortem examination was made, and they are now reported as doing well.

Some trouble was reported among cattle at Hartland and Milford, but on examination by the Commissioners, the disease was decided to be sporadic. I visited the herd of B. L. Mead, of North Greenwich, which I found suffering from contagious pleuro-pneumonia. Although the trouble was of long standing, some of the cows certainly were in a condition to convey the disease to healthy or non-infected animals. There were ten cows, one pair of oxen, one yearling and six calves in this herd.

The herds of Daniel M. Griffin, Joseph B. Husted, David D. Hawley and Mr. Porter were visited, but no cases of the plague were found. Reports from Watertown, Waterbury, North Bradford, Hartland and Milford were of such an assuring character that I did not deem it necessary to visit those points.

NEW YORK.

I am indebted to the New York Commission for the following statement, made February 12, 1880:—

Putnam County.—On the line of the Harlem Railroad there have been lately slaughtered 176 animals; of these, forty were acute cases. The others, having been exposed to the contagion, were killed to prevent the spread of the disease. The beef was marketed.

In the town of Kent, Joseph R. Sprague has an infected herd of sixty head of cows, steers and calves. They are now in quarantine.

Westchester County.—In Yonkers, Mr. Austin had a herd of twenty-seven head, which had been reduced by the ravages of the disease to eight animals. Mr. Pierpoint had a herd of eleven head which had been exposed to infection; two of these had been killed. Mr. Cheever, on Odell's farm, has a herd of twelve head that have been infected. Mr. Cayl has one animal infected.

In Croton Falls, Bedford Township, Mr. Butler, who generally keeps about fifty animals, has lost by death and slaughter, his entire herd, with one exception.

New York City.—In the city there are believed to be but five infected stables left. These are in quarantine, and are located as follows:—

- No. 1.—West Seventieth street, old chronic cases.
- No. 2.—West Seventy-eighth street, acute cases.
- No. 3.—East Ninetieth street and Madison avenue, acute cases.
- No. 4.—120th street and Fourth avenue, acute cases.
- No. 5.—121st street and Fourth avenue, acute cases.

LONG ISLAND.

The whole western end of this island, as far back as Jamaica, is more or less infected. The stables of Gaff, Fleischmann & Co., of Blissville, originally the hotbed of the disease, are now perfectly free from all contagion. Jamaica is located some ten and a half miles back, therefore the infected district includes Brooklyn, New Utrecht, Flatbush, Gravesend, Flatlands and New Lots, in Kings county, and Long Island City, Newtown, Jamaica, Flushing and Creedmoor, in Queens county.

Suffolk County.—At the extreme eastern end of the island are extensive unfenced ranges used as common pastures. The plague

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prevailed among herds grazing on these ranges, but it is now believed they are thoroughly freed from it, as the last known cases were destroyed at Montauk, August 28, 1879, and at Bellport, August 11, 1879. This portion of the island has been subjected to numerous examinations, and is now regarded as entirely free from the plague.

STATEN ISLAND.

A year ago one case of the plague was discovered on this island. The animal was killed. No case has since appeared, and the island is now regarded as absolutely free from the disease.

On the 12th and 13th days of February, in company with one of the New York inspectors, I visited several stables in Brooklyn. I found several chronic cases in the stables, but no acute ones. At Johnson avenue slaughter house I was shown a portion of a characteristically diseased lung, which had been taken from an animal killed a few hours previously.

On February 14 I visited the stables of Mr. Lang, 109th street and 4th avenue, New York, where I found three cows suffering with the plague. One of these was a very acute case, and, I was informed, had been afflicted but three days. This, and one of the others, had been condemned to the offal dock. Mr. Foudre, a neighbor of Mr. Langs, lost a cow on the 12th day of February by the disease. A week before he had bought a cow from a dealer named Louis, and the cow that died was taken sick on the day that this cow came to his stable. The nearest stable to Mr. Foudre's place is on 112th street and Fourth avenue. Mr. Foudre had owned the cow he had for eight months. Lang purchased his sickest cow from a dealer named Franke some five or six weeks previous. She was a "two titter" and on that account Franke knocked off \$5 on her price. She never did well. The other two commenced coughing three or four days before my visit.

On the afternoon of the same day I visited the offal dock and witnessed the autopsy of Lang's cows, alluded to above. Both cases revealed well marked lesions of acute pleuro-pneumonia contagiosa. One of the animals, which showed a temperature of 105 degrees Fahrenheit and thirty-six respirations per minute,

had the whole posterior lobe of the left lung consolidated and strongly adherent to the costal pleura. The right lung was healthy. The pericardium was thickened to half an inch. In both lungs of the second cow were found a number of small isolated spots of the characteristic lesions of the disease, the largest being about the size of a double fist. Their borders were well defined, and the intermediate portions of the lung tissue appeared perfectly healthy to the naked eye. On February 16th, at Twentieth street and Fourth avenue, I found three cows which had been exposed to infection and were in quarantine. They appeared healthy, and one had just been sold to a butcher named McEvoy.

In Fremont, at the stable of Mr. Bohle, I found two cows, one of which had been put into an infected stable on Christmas. Her temperature was 101 degrees, Fahrenheit, and she was breathing at the rate of thirty respirations per minute. The other animal was a Jersey cow. Both animals had been ordered slaughtered as soon as they could be got ready for the butcher. A Mr. Cannons, a neighbor, had had some trouble with his herd, but they were quarantined and seemed to be doing well. The infection to this herd of Mr. Bohle's was communicated by a cow that was pastured with ten others on a common lot. She developed contagious pleuro-pneumonia, and was killed in the month of August. Three months and nineteen days thereafter the second animal was attacked, and sent to the offal dock, where she was slaughtered. At the end of three weeks a third, and at the end of four weeks a fourth animal was taken sick and both were slaughtered. The first one of these animals belonged to Mr. B. Jorkman, the other three to Mr. Bohle, who, as has been before stated, bought a fresh cow on Christmas and put her in with one remaining from his original herd. This was in direct violation of the law and his instructions. She is now diseased and has been ordered to be killed. These ten animals were strictly isolated as soon as the first cow was killed, and no other infection was then possible. Two of them have since been fattened and sent to the butcher in a healthy condition. The remainder, with the exception of those belonging to Mr. Bohle, are still free from disease.

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On the 17th day of February, in company with Professor Law and Dr. Hopkins, I visited the farm of Mr. Joseph Sprague, in Kent, Putnam County, whose herd was infected and had been in quarantine for some time. The herd consisted of fifty-three head, and were sold during the day by the State Commission to butchers who had been notified to attend. The animals brought an average of \$6 per head, which was regarded as a low price. Three of the animals were considered too badly diseased for beef, and on being killed showed well marked lesions of the disease in its different stages. The herd was infected by a cow purchased from a dealer named Robinson.

On February 18, in company with the same gentlemen, I visited Croton Falls, Westchester County. We found here a gentleman by the name of Butler, who had lost thirty-one animals out of a herd of thirty-two by the plague. His remaining cow was in quarantine, with no symptoms of the disease manifest. On the 15th of June last, Mr. Butler bought seventeen cows of Mr. Robinson, the dealer above referred to, and they were delivered to him on the 17th of the same month. They had been pastured all the summer on "Hyatt's Lower Farm," with a cow that had been sick but had recovered. The first animal on Butler's farm sickened on September 16, and soon died. The remaining thirty head were either slaughtered for beef or killed diseased.

On February 19, in company with the same gentlemen, I visited the farm of Mr. Daniel Austin, in Yonkers, Westchester County. Originally this gentleman had a herd of twenty-seven head, eighteen of which had either died of the plague or had been killed for beef in the incipient stages of the disease. Five of the animals were killed for beef, and showed no lesions of the disease. Of the four remaining, two are well marked chronic cases —*i. e.*, having portions of encysted lungs. This herd was infected by a cow that had pastured on an infected range called "Hog Hill," in the town of Yonkers. She wandered into a field near Mr. Austin's place, where she died on the 27th or 28th of July, and was not buried for some days after. The disease appeared among Mr. Austin's cattle on October 21. The herd of Mr.

Odell, on whose farm this cow died, was no doubt infected by the same animal. His herd consisted of some valuable Jerseys, among which the plague appeared on August 28. We killed three of his animals, and they all showed well marked lesions of the disease.

On February 20 we visited Mr. Tice, of Newtown, which is a suburb of Brooklyn, L. I. This herd was infected about the middle of October. Eight of his animals died, and he had continued to fill their places with fresh animals. We found twelve of his animals suffering with the plague. Two cows were killed—one an acute and the other an older case—and both showed well marked traces of the disease. His herd was infected by a cow sent him about the 20th of September.

A Mr. Grady, whose stables are in Blissville, a portion of the suburbs of Brooklyn, had lost eleven head of cows out of a herd of fourteen since the middle of September.

PENNSYLVANIA.

I arrived in Philadelphia on February 24, and during the evening visited and had a conversation with Dr. J. W. Gadsden, relative to the prevalence of the plague in Pennsylvania. Dr. Gadsden showed me a private telegram giving him the information that the British Government contemplates raising the embargo on cattle transported from the Western and Southwestern States through Canada, and shipped to Great Britain from ports of the Dominion Government. On the morning of February 25, in company with Dr. Francis Bridge, I visited the farm of Mr. J. F. Taylor, located near the town of Marple, Delaware County, Pa. We found this gentleman's herd suffering with the disease. Having selected and paid for four acute cases, the animals were slaughtered and examined. The post-mortem examination revealed all the lesions of the disease in its acute stage. This herd was infected by a cow purchased by Mr. Taylor in the Philadelphia stock yard. She was in very good condition, and when she arrived on the farm seemed very tired. Next morning she refused to eat and seemed sick. She died a few days thereafter with all the symptoms exhibited by those that have since died of

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On February 26 I visited the farm of Mr. Wynne, near Philadelphia. His herd originally consisted of thirty-four head. Ten of these had already been killed and two had died of the disease. An examination of those left developed the fact that the disease was still present in both an acute and chronic form. The owner objected to the slaughter of any of the animals. His herd was infected by some cows he purchased in the Philadelphia stock yards. The disease broke out about the 1st of June last.

On the 27th of February I visited Messrs. Martin Fuller & Co., who have charge of the Philadelphia stock yards. They offered me every facility for an examination of the premises. During my interview with these gentlemen Mr. Fuller said something ought to be done to relieve the dealers in stock from the oppression of the English embargo; that the European trade is now carried on at a positive loss, and that this loss is clearly traceable to the embargo on our live cattle. He further stated that he was in Europe last season and found the market flooded at Liverpool. His stock was detained fifteen days in quarantine before it could be slaughtered. Besides the expense of feeding all this time, his animals were positively shrinking in weight: that when they were finally slaughtered he was compelled to accept any price offered. He found dealers there who said they could afford to give from \$15 to \$20 per head more for the animals if they were allowed to drive them back into the country and slaughter them only as needed. During the day I met by appointment, Secretary Edge, special agent of the Governor. He seemed to appreciate the fact that more thorough and active measures than those heretofore used, are necessary for a complete suppression of the plague. He thinks the better plan would be to pay a good price for all exposed animals, and that in the country all exposed and infected animals should be slaughtered, as well as those acutely diseased. Under existing circumstances he does not think it would be politic for the State of Pennsylvania to thoroughly eradicate the disease; indeed, he does not think this possible so long as the southern border of the State is unprotected from importations from Maryland. Until quarantine measures are established

against this State, or the State itself takes some action for the suppression of the disease within its borders, the State of Pennsylvania cannot hope for success. The farmers of Pennsylvania will go to the Baltimore stock yards to buy "frames" and in this way new cases are continually being brought into the State. Under the present construction of the law sufficient means to pay a fair indemnity cannot be obtained, and to kill even diseased animals without funds to pay for them, the Secretary believes would result disastrously, as it would prejudice the farmers against a better law which is hoped for in the near future. His policy is simply an effort to keep the disease within its present limits, with the destruction of as few animals as possible. Up to January 1, 1880, the Secretary had expended but \$2,700 in repressive measures.

On February 28, while examining some cows at the stock yards, I found an acute case of contagious pleuro-pneumonia. The affected animal was in a yard with some twenty other milch cows, and all were being offered for sale. This animal was seen also by Dr. Bridge. On March 1, while examining lungs of slaughtered animals at the Philadelphia abattoir, I found one showing the well-marked lesions of the plague. The butcher said the animal came from Illinois, but it was afterward traced to Cecil County, Md. On the 2d day of March I visited Camden and learned some facts relative to the extent of the plague in New Jersey. On the 3d inst. I attended a meeting of the farmers and stock raisers in the infected district. The meeting was held in Philadelphia and was called for the purpose of devising means for the extirpation of the plague. During the day visited Elm station, Montgomery County, and assisted in selecting six diseased animals from Mr. Wynne's herd, for the purpose of post-mortem examination. On the 4th and 5th days of March I was engaged in examining lungs of slaughtered animals at the Philadelphia abattoir. I found no traces of the disease, but on the 4th inst., while examining some cows at the stock yards, I found a second case of the plague in an animal that came from near Gettysburg, Adams County, Pa.

The following are the sources of infection and locations of

diseased herds in Pennsylvania :—

Philadelphia County.—The Philadelphia stock yards are infected. These yards are constantly receiving and sending out to different localities diseased and infected animals.

Chester County.—Mr. M. Covning, of Chester Valley, has a herd of twenty-seven head, among which the disease has appeared. The herd was infected by a cow purchased from a drover, and the infection could not be traced.

Mr. J. Dickinson, of Chester Springs, has a herd of twenty-eight head. These animals were infected by the owner, who brought the contagion from a neighboring farm, where he had administered medicine to a diseased animal.

Mr. G. V. Renard, Chester Valley, had a herd of eighteen animals infected by his neighbor's cattle (Mr. Covning's).

Mr. Renard's cattle had infected a herd of fourteen head, owned by Mr. J. W. Wilson, his near neighbor.

Mr. C. Holland Frazer, of the same neighborhood, had a herd of twenty-six head infected by a purchased animal, which he was unable to trace.

Mr. W. Pugh, of Chester Springs, had his herd infected by Mr. Dickinson, alluded to above, who visited this herd for the purpose of administering medicine to a sick animal.

W. J. and H. A. Pallock, Downington, had a herd of thirty head infected by a purchased animal.

Mr. W. Reid, Westchester, herd of five head. Chronic cases; source of infection unknown.

Mrs. Hermann, Westchester, herd of twelve head. Infected from neighboring cattle.

Mr. W. E. Pennypacker, Cambria, herd of fourteen head. Probably infected from neighboring herd.

Holmes & Bunting, Oxford, herd of thirty-five head. Infected by Mr. Turner's cattle on adjoining farm.

Mr. M. Young, Bradford, herd of thirty-six head. Infected by Mr. Turner's cattle.

Between the herds of Holmes & Bunting and Mr. Turner was a large meadow. The bulls broke down the two intervening fences, and the herds mingled in the meadow. The herds were

separated as soon as men on horseback could separate them, but not soon enough to prevent infection.

Montgomery County.—Messrs. J. L. & A. S. Reiff, Worcester, herd of fifteen head. Jacob L. Reiff had bought of five different dealers during May and June, and it was impossible to tell from which one the disease came. Two animals have died and two others have been killed by order of the State Inspector. Five others had been slightly affected, but had recovered. A. S. Reiff purchased a cow of his son in July, about the time of the outbreak. One animal died and a second one was condemned and killed by order of the State Inspector. Five other animals were affected, but all had recovered and had been released from quarantine.

Joseph Tyson, Worcester, herd of thirteen head. Mr. Tyson purchased a cow of a man who had previously purchased her at the Philadelphia Stock Yards. She was killed on September 24, 1879, by order of the State Inspector, but as she had been isolated on the appearance of the first symptoms of the disease, only one other animal was infected.

Charles T. Johnson, Lederachsville. This gentleman's herd was infected by an animal purchased from a dealer. Up to the date of the first inspection in October last, five animals had died. One was afterward condemned and killed. Five out of the remaining ten were affected, but had recovered.

Peter M. Frederick, Lansdale. Herd quarantined January 29, 1880. The infection was communicated by a cow purchased in the Philadelphia stock yards. Two animals had been condemned and killed. The remainder—ten animals—were free from disease on March 4.

Jacob D. Wisler, Worcester, herd quarantined February 6. Three animals had been condemned and killed, and three others were sick.

John C. Blattner, Worcester, herd of sixteen head. The plague had prevailed in this herd in a mild form for the past four months. None of his animals died, and he did not suspect the nature of the disease. His cows were greatly reduced and he had been feeding at a loss. One of his animals had commenced

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to lay on fat, and all were free from disease except the altered structure of the lungs, the natural result of the disease. This herd was infected by Mr. A. S. Riess's cattle, mentioned above.

W. W. Latrobe, Merion, herd of fourteen head.

W. Wynne, Elm Station, herd of twenty-eight head. This gentleman had lost several animals. The infection came from a cow purchased at the West Philadelphia stock yards.

Bucks County.—Aaron Yoder, Dublin. This herd was quarantined September 25. The first to sicken was one that he purchased two weeks previously. As she had passed through the hands of three different parties, it was impossible to trace her back satisfactorily. Three out of the four were affected, but had recovered.

Isaiah Kletzing, Dublin. This herd received its infection from Yoder's cattle before they were quarantined. Three animals had recovered.

Lehigh County.—Charles Krauss, East Greenville. This herd was quarantined December 13. The infection came through a cow purchased at the Baltimore stock yards. Two animals died and eleven were condemned to be killed. Thirty animals remain and are thought to be free from disease.

Cumberland County.—Samuel Hess, Eberly's Mills. Herd quarantined March 20, 1879. Infected by cattle coming from Baltimore stock yards. This herd is in York County.

Delaware County.—R. L. Jones, Upper Darby, herd of forty-nine head. Infected by purchase from Philadelphia stock yards.

Thomas Cunningham, Upper Darby, herd of twenty-one head.

J. G. Haenn, Darby, herd of fourteen head.

J. Lickens, Ridleyville, herd of fifteen head.

J. F. Taylor, Marple, herd of thirty-six head. One third of his animals had died, and the disease was still present.

Lancaster County.—J. F. Turner, near Oxford, Chester County, herd of fifty-two head. Infected by the adjoining herd, into which the disease had been introduced by some calves brought from the State of New York.

David Williams, Colerain. This herd had come in contact with the diseased Oxford herd, and was quarantined before any symptoms of the disease appeared.

Lane Gill, Colerain, herd of five head, adjoining above.
In Adams County—J. Redding, Gettysburg, herd of thirteen head. Infected by purchase from Baltimore Stock Yards.

(*To be continued.*)

NOTES AND NEWS.

PLEURO-PNEUMONIA IN MARYLAND.—At a meeting of the Deer Creek Farmers' Club, of Harford County, the following resolution was adopted:

Whereas, Reports have been published that pleuro-pneumonia exists among the horned cattle in Harford County, therefore be it

Resolved, That although the members of the Deer Creek Farmers' Club have no knowledge of a single case of pleuro-pneumonia, or any other infectious or contagious disease, among the cattle in Harford County, yet, considering the importance of this subject to the farming interest in the future, our representatives in the State Legislature and in Congress are hereby requested to urge such legislation in the respective bodies of which they are members, as may tend to prevent the introduction or the spread of this disease in our State or country.

A committee was appointed to make a thorough enquiry into the matter.—*American Farmer.*

PRIZE.—Mr. I. T. Duncan, V.S., graduate of and Anatomical Demonstrator in the Toronto Veterinary College, has been awarded Hon. I. H. Pope's prize of \$50 for the best essay on contagious pleuro-pneumonia.